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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,468	11/19/2003	Gan-Lin Hwang	0941-0869P	3761
2292 7590 03/18/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
KENNEDY, SHARON E				
ART UNIT		PAPER NUMBER		
1615				
NOTIFICATION DATE		DELIVERY MODE		
03/18/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

### Office Action Summary

**Application No.**

10/715,468

**Applicant(s)**

HWANG ET AL.

**Examiner**

Sharon E. Kennedy

**Art Unit**

1615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- Paper No(s)/Mail Date \_\_\_\_.

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

Claim 2 is objected to because of the following informalities: It is two sentences. The second sentence will not be examined. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 8-12, 21-25 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a carbon nanocapsule thin film having a carboxyl functional group, does not reasonably provide enablement for any other functional groups. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to prepare the invention commensurate in scope with these claims. Applicant provides two examples of the process in paragraphs [0024] and [0025], both yielding the product having the carboxyl functional group. Redox reactions are unpredictable, particularly with graphite crystals and functional groups. Applicant must have shown these other variants in order to be entitled to these claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 14-19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Nakamoto, US 2002/0060514. Nakamoto discloses a method of depositing fullerenes or carbon nanotubes onto a substrate by an electroless plating process as discussed in paragraphs [0064]+ and by an electroplating process as discussed in [0072]+. See Sheet 4, Figures 7A-C for the electroplating process and the descriptions thereof. Regarding claim 2, requiring a polyhedral carbon cluster, in the absence of further limiting features, the examiner takes the position that the carbon nanotubes anticipate the claimed embodiments. Regarding 4, since the plating material co-precipitates during the electroplating process, at least a portion of the carbon nanocapsules are metal-filled. Regarding claim 5, applicant should note paragraph [0072], fourth line. Regarding claim 15, the balls within balls structure must be inherently disclosed by Nakamoto since the process claimed is substantially identical to that disclosed by Nakamoto. .

Claims 7, 13, 26 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nakamoto. Regarding claim 7, Nakamoto discloses an electroplating process having voltages sets at 100V, 10V and

0V. See [0071]. Applicant claims an electric field of 0.01V to 6V. Claim 7 is a product by process claim. The examiner takes the position that since the 6V claimed is close to the disclosed 10V, note also a voltage of 7V is disclosed in [0068], line 11, that the nanocapsule thin film is identical to the claimed film prepared by the claimed process. In the alternative, it would be obvious to one of ordinary skill in the art to vary the potential of the external electric field to form various polyhedral carbon clusters at different voltages as is known in the art. Regarding claims 13 and 26, applicant requires that the claimed thin film comprise carbon nanocapsules in a range of 20 to 100 vol%. This encompasses the entire usable range of thin film compositions disclosed by Nakamoto and is likely inherent. In the alternative, it would be obvious to one of ordinary skill in the art to adjust the plating solution (see [0071]) composition which is precipitated with the fullerenes or carbon nanotubes as desired.

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Gogotsi et al., US 2002/0141934. Gogotsi discloses a method of forming graphite polyhedral crystals which may take many forms including rings, columns, nanorods, etc., as set forth in paragraph [0031], which also discloses the diameters of the nanotubes. Regarding claims 6 and 7, although applicant is requiring an external electric field, the claim is product by process claim, and the product formed is identical to that claimed. See the figures depicting the carbon polyhedral structures. Applicant requires a nanocapsule thin film as well, however, the film is not described and is anticipated by Gogotsi in view the crystals are deposited on another substance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-12, 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamoto '514 in view of Murphy et al., US 6,399,785 or Hinokuma et al., US 2002/0187403. Nakamoto discloses the invention as described above but fails to disclose a nanocapsule, etc., having substituted functional groups. The secondary references are cited to exemplify that the process is well known. It would be obvious to one of ordinary skill in the art to modify the carbon film as per the Murphy or Hinokuma methods, after the deposition of the film, for example, to achieve the purpose synthesizing fullerenes, etc., having improved usefulness. The examiner is cognizant that applicant deposits an already functionalized carbon, however, the claims do not point this out.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamoto '514. Nakamoto discloses an electroplating process having voltages sets at 100V, 10V and 0V. See [0071]. Applicant claims an electric field of 0.01V to 6V. The examiner takes the position that since the 6V claimed is close to the disclosed 10V, note also a voltage of 7V is disclosed in [0068], line 11, that the nanocapsule thin film is

likely identical to the claimed film prepared by the claimed process and the difference in voltage is obvious. It would be obvious to one of ordinary skill in the art to vary the potential of the external electric field to form various polyhedral carbon clusters at different voltages as is known in the art.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharon E. Kennedy whose telephone number is 571/272-4948. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, can be reached on 571/272-8373.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*/Sharon E. Kennedy/*  
Sharon E. Kennedy  
Primary Examiner  
Art Unit 1615